



Renovating a Complex Environmental Management System: Performance Innovation at TVA

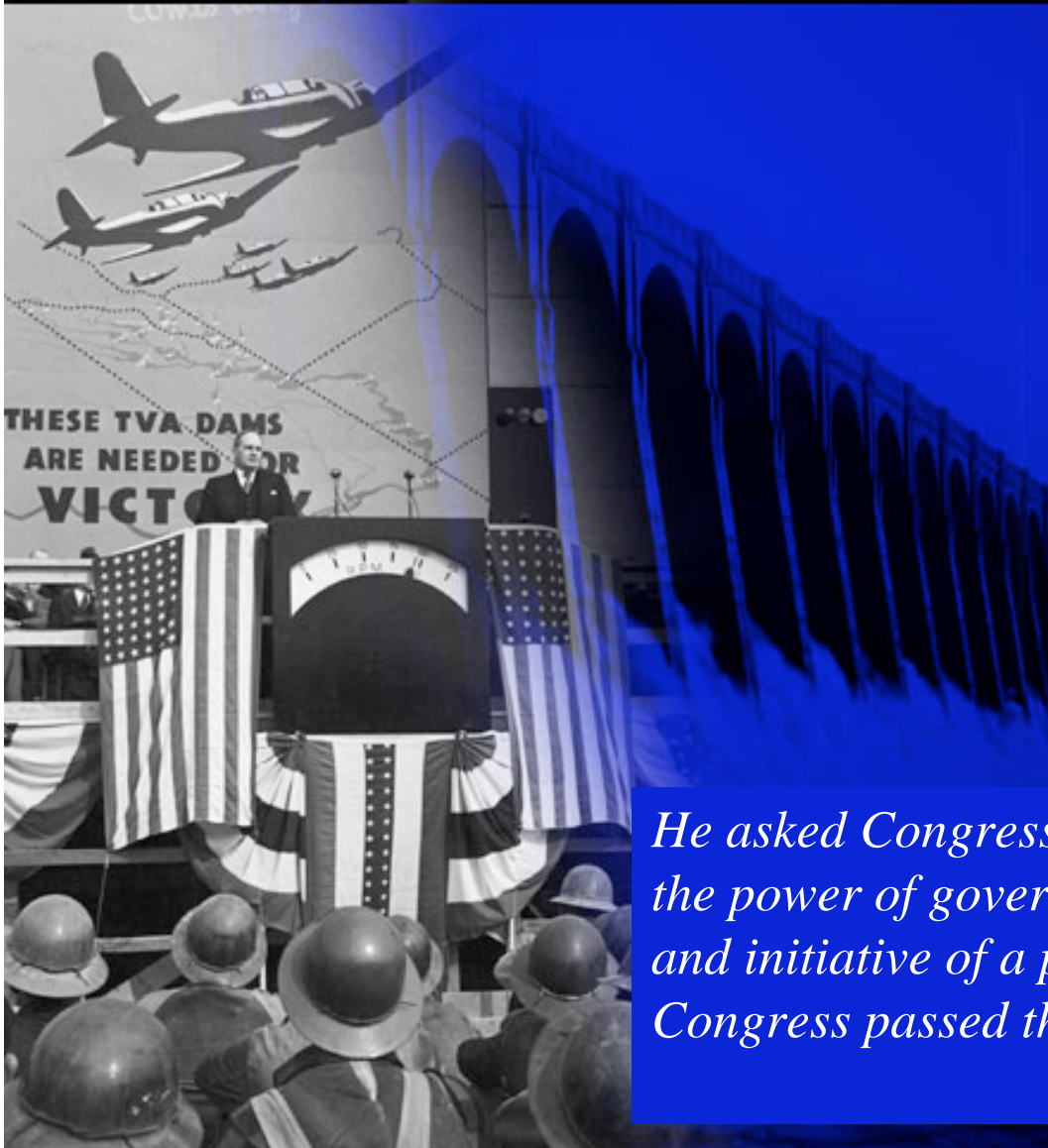


AHC Group
14th Annual Corporate Affiliates Workshop
January 27-28
Phoenix, Az

Warren Behlau
Sr. Manager
Performance Analysis and Reporting
Environmental Policy and Planning
Tennessee Valley Authority



The Early Days



He asked Congress to create “a corporation clothed with the power of government but possessed of the flexibility and initiative of a private enterprise.” On May 18, 1933, Congress passed the TVA Act.

- Franklin Delano Roosevelt



What Is TVA?

Power generation

- Nation's largest public power system
- 31,658 Megawatts Capacity
- \$7. Billion in Annual Revenue

Transmission

- 99.999 percent reliability
- 80,000-square-mile service area

Customers

- 158 power distributors
- 62 directly served customers
- 11 power exchange arrangements

Stewardship

- Nation's fifth-largest river system
- Management of 800 miles of commercially navigable waterways
- 49 dams for integrated river management

Economic Development

- \$2 billion spent in Seven Valley states for products & services
- \$338 million in tax-equivalent payments to Valley state & counties

Lessons Learned – TVA's EMS

- Keys to improved performance and sustainability:
 - Management commitment
 - Ownership and accountability
 - Include operations in development
 - ISO 14001
 - **Emphasis on prevention**
 - Measure and report
 - EMS auditing, self-assessments, corrective action
 - **Start with structure and responsibility**
 - Integrate the EMS everywhere you can
 - **Faster results with a corporate-wide approach**
 - Persistence and promotion
 - Financial incentive



Make a system, not a notebook

Env. Performance Exceeds Target

- Results:

- Environmental impacts measured in the index are down 19%
- Standardized training saved \$3.5 million in 2004
- Reduced average internal audit findings per facility an additional 40% since 2000
- Reduced internal repeat audit findings an additional 77 % since 2000
- Reduced number of Reportable Environmental Events an additional 20% since 2000
- Lowest SO₂ and NO_x emissions in 29 years





How did TVA do it?



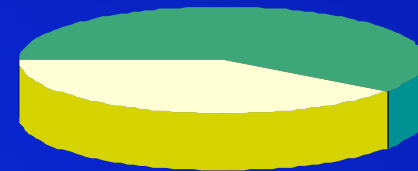
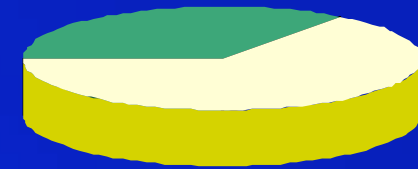
What Is an EMS?

- Combination of components that may function well alone but better as a system
- Think of an EMS as a collection of car parts that, only when assembled and working together as a system, enables you to get to your destination
- This “vehicle” must be fueled by the governance systems of TVA and operated using the infrastructure of the company.



TVA EMS Evolution

- Pre-1996 – compliance processes
- 1996 EMS – based on draft ISO 14001
- 2001 EMS – based on final ISO 14001



Sustainability & Performance

- What it did:

- Policy
- Processes
- Environmental training
- Process indicators and environmental goals
- Performance reporting
- Regulatory review and guidance process
- Environmental compliance audits, self-assessments, and corrective action



TVA's First EMS (cont.)

- What it didn't do:
 - Process to maintain and develop policy
 - Identify roles and responsibilities
 - Method to maintain EMS documents
 - Track the indicators or set goals
 - Report performance
 - Receive management review
 - Standardize environmental review (NEPA)



TVA's First EMS (cont.)

- What it didn't do:
 - Leverage regulatory review and guidance
 - Audit EMS requirements or verify corrective actions
 - Communications and stakeholder involvement
 - Records management
 - Emergency response and notification
 - Recognition





TVA and the Principles of a Strategy-Focused Organization (SFO)





Principle 1: Mobilize Change Through Executive Leadership

“TVA’s Winning Performance Balanced Scorecard allows the men and women of TVA to establish priorities; measure and report performance in key areas; understand how individual activities are tied to company priorities; and link individual compensation to company-wide results.”

Glenn L. McCullough, Jr.
Chairman of the Board
Tennessee Valley Authority



Principle 1: Mobilize Change Through Executive Leadership

- Case for change established initially through Business Transformation effort – later through Strategic Plan
- Existing vision and goals incorporated into methodology
- President and COO served as executive sponsor
- Every Officer personally participated in roll out
- TVA Scorecard is the cornerstone of Performance Plan Reviews
- Integrated into Executive and Board talking points for media pitches, employee meetings and presentations



Obtain Executive Leadership



Chairman
Glenn L. McCullough, Jr.



Director
Skila Harris

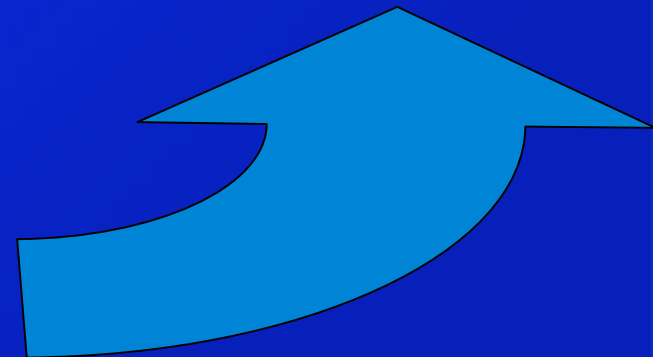


Director
Bill Baxter



President and COO
Ike Zeringue

Executive Sponsor





Principle 2: Translate the Strategy into Operational Terms

Performance Improvement:
The Bottom Line



Principle 2: Translate the Strategy into Operational Terms

- Define strategic direction
- Establish a process-based methodology
- Leadership Standard was developed to begin translation of strategic intent
- Critical Success Factors were incorporated into capital project justification process
- EMS revitalization driven to satisfy the Critical Success factor on Environment.

TVA's Current EMS

- What's new:
 - Actionable corporate policy and a process to maintain and develop policies
 - Roles and responsibilities from TVA Board of Directors to technician
 - Standardized environmental processes with biennial review
 - Standardized environmental training and Web application



- What's new:
 - Aspect and impact analysis, objectives and targets
 - Tracking and reporting to management and stakeholders
 - Collaborative teams of experts reviewing regulations and issuing guidance
 - Risk-based compliance and EMS audits with closure verification
 - Emphasis on self-assessments
 - Cause trend analysis



- What's new:

- Standardized environmental review documents and Web-based record and tracking system
- Communication and stakeholder involvement process to “speak with one voice” on environmental issues
- Standardized recordkeeping emphasizing electronic storage
- Emergency preparedness and Web-based notification system
- Environmental excellence recognition





TVA's Current EMS (cont.)

- What's new:
 - Internal Web site devoted to the TVA EMS





TVA's Current EMS (cont.)

Environmental Impact Index

A composite of environmental performance factors in terms of beneficial and detrimental impacts (or precursors) on Air Quality, Water Quality, Land, Waste Production, and Energy Consumption.



Environmental Impact Index

•Air Quality

- NO_x
- SO₂
- CO₂

•Water Quality

- Water Discharges
- Spills to Water
- Dissolved O₂
- Minimum Flow
- Biological conditions

•Land

- Net allocation of protected land
- Spills to Land
- Alternative ROW management

•Waste Production

- Hazardous Waste Disposed
- Low Level Rad Waste
- Office recyclables
- Scrap Metal Recycled
- Hazardous Waste Recycled
- Fly ash, bottom ash, and gypsum utilized

•Energy Consumption

- TVA Buildings' Energy Consumption Green Power Switch blocks sold
- Energy Demand Reductions
- Number of Energy Efficient New Home Installations
- Consumption reduction due to energy efficient heat pump installations



Environmental Impact Index

Air Quality	40%
Water Quality	25%
Land	10%
Waste Production	15%
Energy Consumption	10%
Baseline Score	100.0%



Environmental Impact Index

Environmental Impact Index is the sum of performance scores for 26 elements. Each element's performance score is based on a ratio of actual performance over the baseline performance in FY'02. The multiplier is based on significance of impact and our level of control.

(Step1)

$$\frac{\text{Actual Performance}}{\text{FY'02 Baseline}} \times \text{Multiplier} = \text{Element Score}$$

(Step 2)

$$\text{Total of 26 Element Scores} = \text{Environmental Impact Index}$$

Drivers:

- Improve environmental performance
- Employee awareness of operational impacts
- Allow responsive modifications to operations
- Line-of-Sight / Winning Performance at all levels
- Support CSF



Strengthen the Line of Sight

Corporate Mission

TVA Act

1933

Defined Strategy

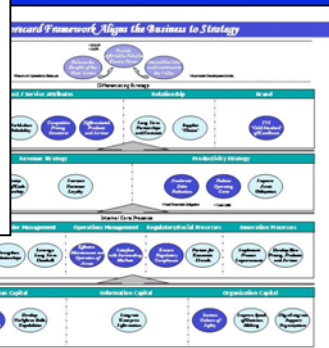
Tennessee Valley Authority
Strategic Plan

*A Framework for a
Competitive Future*

January 2004



TVA Strategy Map



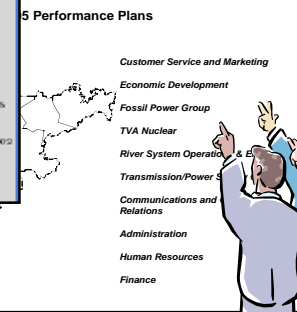
Leadership
Standard



TVA Scorecards



Performance
Plans



Line of Sight

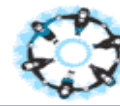


Establishing Measures & Targets

The Same
Scorecard For
All Employees,
including
Executives

Winning Performance

TVA's Six Strategic Objectives



TVA Balanced Scorecard for September 2004

	Weight	Status	Actual YTD	Plan YTD	Year End Actuals	GOALS		
						Target *	Mid	Stretch
Financial								
O&M Costs (\$ millions)	15%	↑	3,581	3,644	3,581	3,644	3,608	3,535
Financial Strength (\$ millions)	15%	↑	278	225	278	225	275	375
Productivity (kWhs/\$)	10%	↑	156.1	147.8	156.1	147.8	150.8	152.4
Customer								
Customer Satisfaction (%)	10%	↑	126.2	100.0	126.2	100.0	117.0	130.0
Economic Development (index)	10%	↑	120	100	120	100	110	120
Operations								
Asset Availability (%)	20%	↑	101	98	101	98	100	102
Environmental Impact (index)	10%	↑	81	98	81	98	91	85
People								
Safe Workplace** (all injuries/hrs. worked)	10%	↑	2.33	2.41	2.33	2.41	2.36	2.31



Keeping It All Aligned

Winning Performance

TVA's Six Strategic Objectives



RSOE Balanced Scorecard for September 2004

GOALS

	Weight	Status	Actual YTD	Plan YTD	Year End Actuals	Target *	Mid	Stretch
Financial								
O&M Expense (\$ millions)	20%	↑	134.9	148.5	134.9	148.2	144.6	141.1
Resource Management Contribution (\$ millions)	10%	↑	11.0	6.5	11.0	6.5	7.1	8.3
Customer								
Environmental Impact Index (number)	20%	↑	19.0	22.9	19.0	22.9	21.3	19.8
Operations								
Hydro EFOR - Total System (percent)	20%	↑	1.56	1.60	1.56	1.60	1.25	0.94
TVA-Wide Technology Implementation (number)	10%	↑	14	8	14	8	11	18
People								
Accident Free** (rate)	15%	↑	0.47	0.69	0.47	0.69	0.56	0.45
Diversity (percent)	5%	↑	29.3	25.0	29.3	25.0	28.0	30.0



Principle 3: Align the Organization Around Its Strategy

“Winning Performance is driving continuous improvement. By focusing on what's really important and rewarding it, we the people at TVA, are achieving excellence.”

Ike J. Zeringue
President and Chief Operating Officer
Tennessee Valley Authority



Principle 3: Align the Organization Around Its Strategy

- Develop Balanced Scorecard to measure success
- Strategic Business Units (SBUs) and Business Units (BUs) demonstrate alignment through their performance plans
- Key suppliers have joined in partnership
- Strategic Objectives and Strategic Focus Areas continually reinforced by the Board



Reinforce the Messages

InsideTVA

AUGUST 2004 3

Environmental Impact Index better than predicted

After nine months of measuring, environmental goal between mid and stretch

The Environmental Impact Index is one of the eight Winning Performance goals for fiscal year 2004. The index measures TVA's performance in five categories: air quality, water quality, land stewardship, waste production and energy consumption. These categories include 29 elements such as air emissions, spills to land or water, and reduction of hazardous waste generated.

"For the third quarter, our impacts decreased because of improved processes, additional training for field staffs, increased capital spending to install equipment to reduce coal-plant air emissions, no reportable spills to land and having only 10 spills to water when 17 were predicted," says Warren Behlau, Manager of Performance Analysis & Reporting in Environmental Policy & Planning.



"The third-quarter score for the Environmental Impact Index is 87, which is below the original target of 100, or 13 percent better than predicted. The comparison is against a base-

Winning Performance

TVA's Six Strategic Objectives



TVA Balanced Scorecard for June

	Weight	Status	Actual YTD	Plan YTD	Year-End Forecast	Target*	Mid	Stretch
Financial								
• O&M Costs (\$ millions)	15%	↑	2,583	2,675	3,623	3,644	3,608	3,535
• Financial Strength (\$ millions)	15%	↑	192	33	225	225	275	375
• Productivity (kWh/\$)	10%	↑	150.2	143.7	147.8	147.8	150.8	152.4
Customer								
• Customer Satisfaction (%)	10%	↑	129.6	100.0	130.0	100.0	117.0	130.0
• Economic Development (index)	10%	↑	117	100	100	100	110	120
Operations								
• Asset Availability (%)	20%	↑	101	98	100	98	100	102
• Environmental Impact (index)	10%	↑	87	100	92	98	91	85
People								
• Safe Workplace** (all injuries/hour worked)	10%	↑	1.66	2.41	2.41	2.41	2.36	2.31

Notes:

* Target equals FY04 Performance Plan Target.

** Payout at any performance level is contingent upon no fatalities.

Status:

↑ = Forecast at or better than Target

→ = Forecast worse than Target, but recovery is possible

↓ = Forecast worse than Target, and recovery is unlikely

This scorecard has been posted on the Winning Performance section of TVA's Internal Web site.



Principle 4: Make Strategy Everyone's Job

*“I always wondered why somebody
didn't do something about that...Then
I realized I was somebody.”*

- Lily Tomlin



Principle 4: Make Strategy Everyone's Job

- Winning Performance Results tied to compensation
- Intranet site developed for Winning Performance
 - Monthly scorecard results reported
 - Variance analysis and action plans shared
 - Payout calculator available
- Extensive employee training and education (13,000+)
- Reinforcement through routine communications
- Results improve proportional to the level of trust-equity, consistency and alignment



Getting 13,000 Employees Going in the Same Direction

What does this mean to me?

TVA's Balanced Scorecard is a strategic driver. It is the work of each employee that determines the results for each scorecard measure.



Why do measurements change?

Understanding How TVA Works

Part 6 in TVA's Business Education Series

Measuring TVA's Success





Principle 5: Govern to Make Strategy a Continual Process

Winning Performance
is a Continual
Improvement Process



Principle 5: Govern to Make Strategy a Continual Process

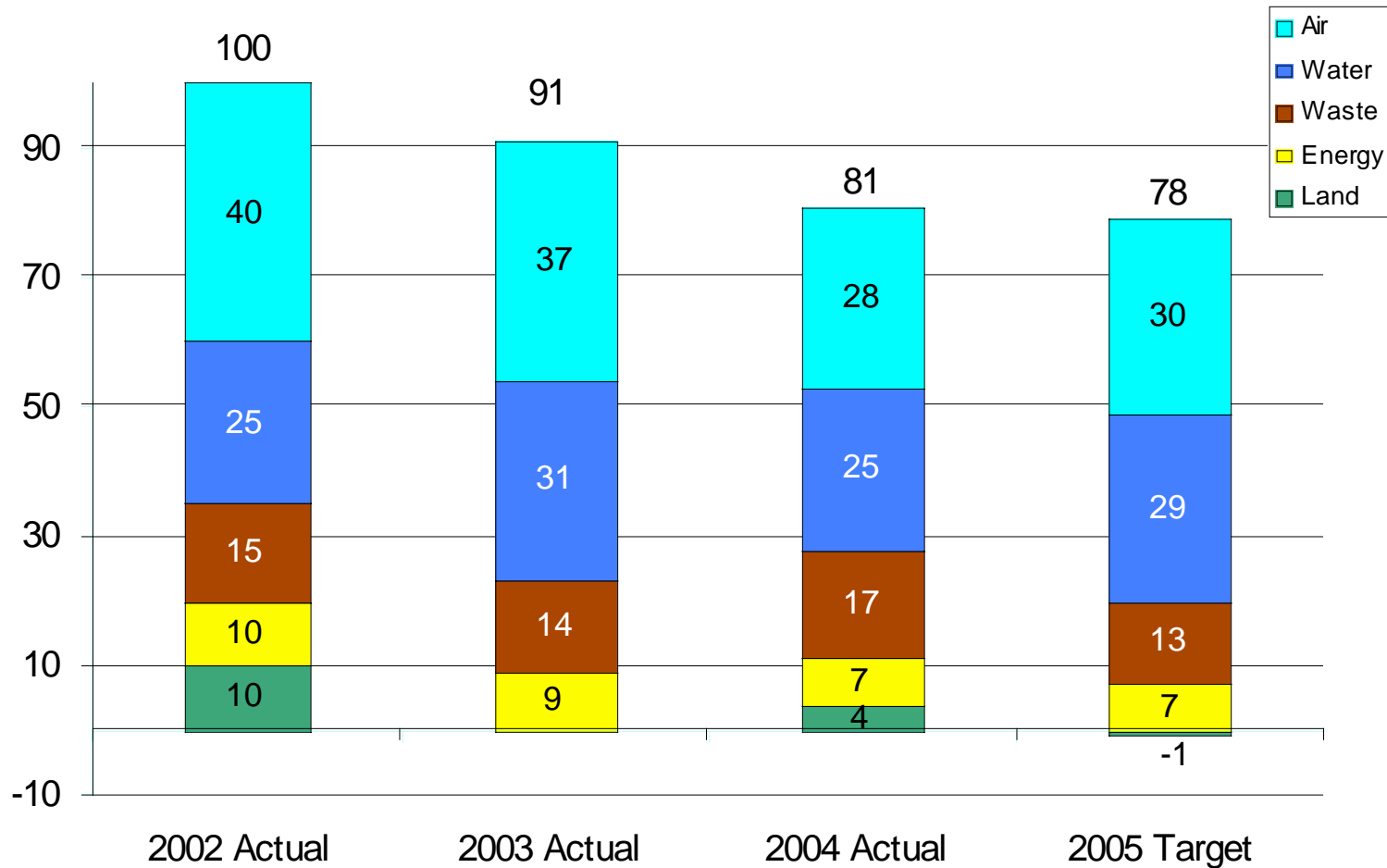
- Process-based methodology needed to sustain continuous improvement
- Overall results reviewed monthly by Board and Management Committee
- Capital expenditures supportive of overall TVA strategic direction
- Winning Performance governed at highest operational level



Getting Results With a Strategy-Focused Organization (SFO)



Environmental Impact Index





Employees Share in the Success

Fiscal Year 2004 Total Employee Payout:

\$42 Million



Questions and Discussion



Addendum



TVA Fiscal Year 2004



**TVA's Best Integrated
System Performance**



2004 - All Time Peak Met

JULY 2004

TVA Meets All Time Summer Peak



**Megawatts:
8 Million People**

TVA Power System Meets Highest-Ever Power Demand

Temperatures in the 90s across much of the Tennessee Valley yesterday pushed the power demand to an all-time record for TVA's power system.

Yesterday's peak demand of 29,878 megawatts was met at 6 p.m. EDT when temperatures across the Valley averaged 92 degrees Fahrenheit.

The previous all-time record was 29,866 M_W on Jan. 24, 2003, when temperatures across the Valley averaged 6 degrees Fahrenheit. The previous summer record was 29,344 M_W on Aug. 17, 2000.

One of the instantaneous readings July 13 in TVA's System Operations Center in Chattanooga



FY04 TVA's Best System Performance

OCTOBER 2004

TVA's Sequoyah and Browns Ferry Nuclear Plants Ranked the Nations Most Efficient Generators

SEPTEMBER 2004

TVA Ranks Among Top 100 American Companies in Innovative Use of Information Technology

SEPTEMBER 2004

Fossil Power Improves Forced Outages: Worth over \$123M

SEPTEMBER 2004

Hydro Generation Forced Outages Decrease By 36%



Fossil Improves Forced Outages

SEPTEMBER 2004

Fossil Power Improves Forced Outages: Worth over \$123M

OCTOBER 2004

12 Fossil Units Set Continuous Run Records

John Sevier Plant Completes 14 Years Without a Lost-Time Injury

Employees at John Sevier Fossil Plant recently established a safety record for TVA coal-fired plants by completing 14 consecutive years without a lost-time injury.

The safety streak dates back to May 17, 1990. During this 14-year period, an average of 145 employees at the plant have worked more than 4.7 million workhours.



John Sevier Fossil Plant near Rogersville, Tenn.



NEWS CLIPS

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Paducah Sun
10-24-04

Better than ever Despite its age, Shawnee Fossil power records

By Joe Walker

Manager Jeff Parsley says the Shawnee Fossil plant is still setting

getting better.
"It's like an old shovel," he said. "The blade gets sharper several times, but it's still a good shovel."

In its 51st year of operation, Shawnee

Widows Creek – TVA's Oldest Unit Sets Longest Run



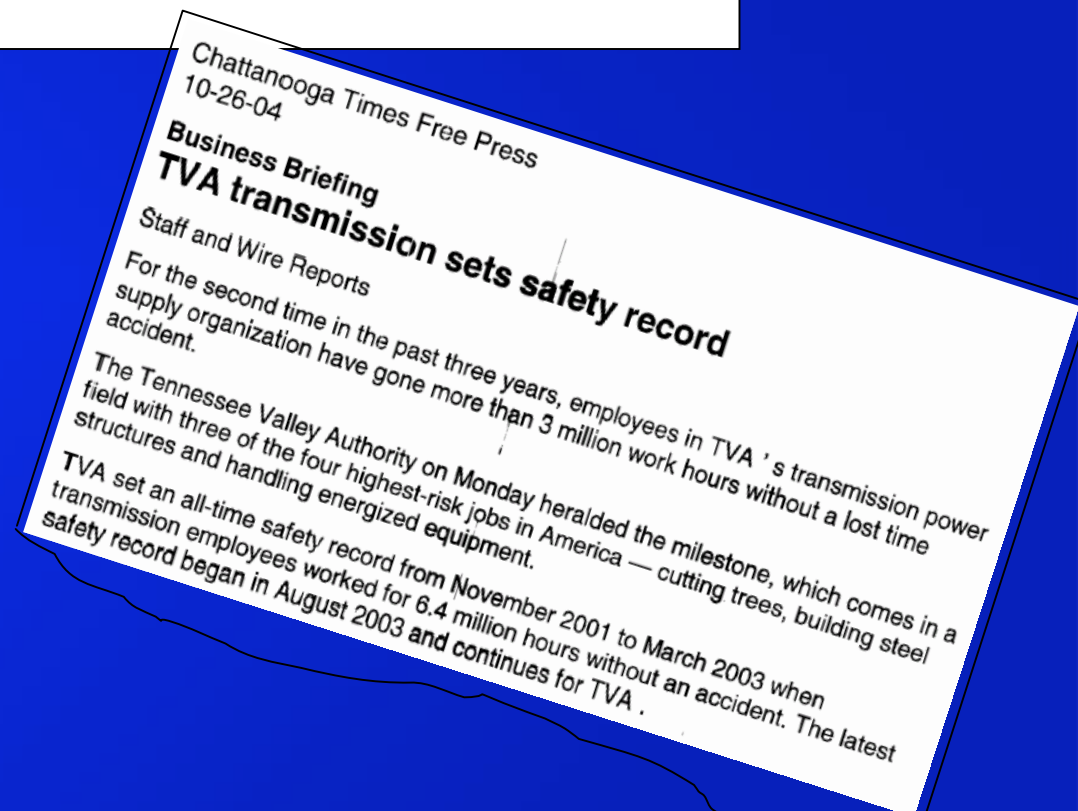
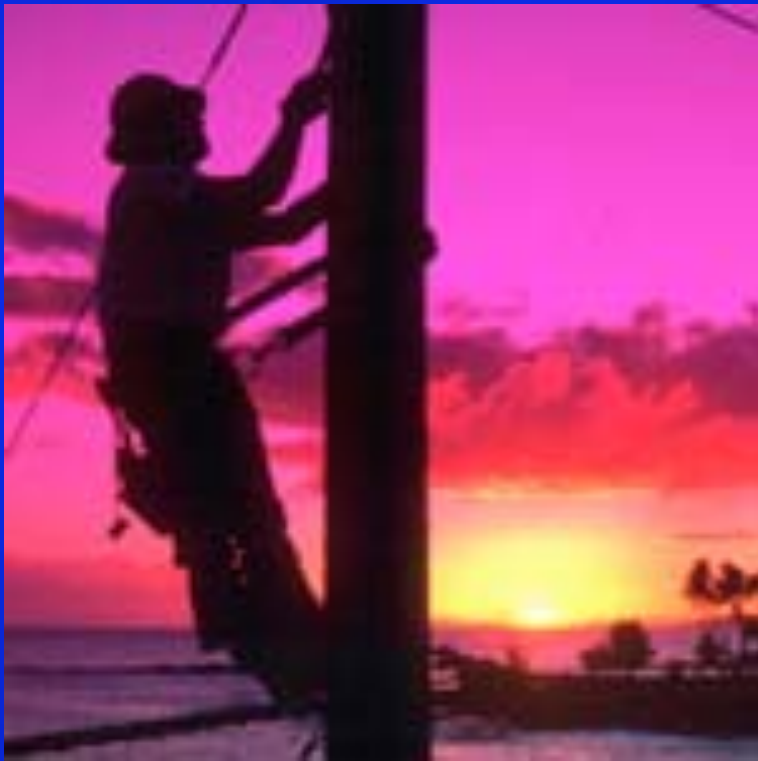
Widows Creek Fossil Plant



Transmission Peaks in Performance

OCTOBER 2004

TVA's Transmission Accident Free Rate In Top 5% of Nation's Largest Utilities





Emphasize individual ownership and accountability



What Is an EMS?

A structured approach that incorporates environmental considerations into day-to-day operations throughout the organization, and is designed to promote continual improvement—OFEE

A continual cycle of planning, implementing, reviewing and improving the processes and actions that an organization undertakes to meet its business and environmental goals—EPA

The part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy—ISO